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INFORMATION REPORT

REPORT

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THIS IS UNEVALUATED INFORMATION

1. The production of locomotives in the USSR, not including narrow-gauge locomotives, shunting locomotives, and locomotives for industrial plants, was scheduled to reach 2,720 units in 1950, of which 2,200 were to be steam locomotives, 300 Diesel locomotives, and 220 electric locomotives. During the period from 1946 to 1950, 6,165 steam locomotives, 865 Diesel locomotives, and 555 electric locomotives were scheduled to be built. The 1950 goal represents a production increase of about 60 per cent over the maximum prewar level of 1935. [redacted] postwar locomotive models have 50 per cent more tractive power than the prewar models. Thus, the scheduled increase of locomotive production considerably exceeded the scheduled increase of industrial and agricultural production. 50X1-HUM 50X1-HUM

Indices of the Production of the Most Important Bulk Goods and of Locomotives

	1940	1950 (scheduled)
Coal	100	151
Iron Ore	100	133
Wood	100	159
Cement	100	180
Crude Oil	100	114
Grain	100	107
Locomotives	100 (1935)	210

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Although the scheduled increase of locomotive production was comparatively high, the scheduled expansion of plants producing locomotives was even higher. The plant capacity was scheduled to be 4,000 locomotives per year by the end of 1950, representing a 300 percent increase over the peak prewar production.

2. [redacted] the actual 1950 production fell behind schedule and is estimated to have been 2,200 units. Also, the production schedule for the period from 1946 to 1950 was not fulfilled, mainly because production fell considerably below schedule in 1946 and 1947. The annual production of 2,700 units presumably was not reached until 1951. A considerable increase in locomotive production may be expected in the following years, because of the scheduled increase in plant capacity. This capacity expansion obviously takes into account the long-range plans for increased industrial production and the present high requirements for replacement of Soviet railroad equipment. It is assumed that the high production capacity will be fully utilized only temporarily, in order to supplement and modernize the present inadequate stock of locomotives. Assuming a depreciation of 2 percent, the production of 4,000 locomotives per year would be adequate to maintain a stock of 200,000 locomotives. The plant capacity, not utilized for locomotive production, will probably be converted to the production of machinery or tanks, as was done before and during the war. The locomotive production in the last six years is estimated as follows: 300 units in 1946; 830 units in 1947; 1,270 units in 1948; 1,460 units in 1949; 2,200 units in 1950; and 2,700 units in 1951.

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3. The general trend in Soviet locomotive production is to increase the tractive power, the technical speed, and the reliability of the locomotives. The reliability of the locomotives has been considerably improved by converting 75 percent of the existing locomotives to automatic coupling. This measure also increased the tractive power from 16 tons for screw couplings to 22 tons for automatic couplings. Efforts are also being made to standardize the construction designs as much as possible, especially the designs for the undercarriages of all types of locomotives, in order to simplify the repair and spare parts problems and to facilitate servicing during operation. Particular consideration is being given to the conservation of power in railroad transportation. For this purpose, a large-scale program for the construction and use of electric locomotives and Diesel locomotives was developed after the war and the construction of condensed steam locomotives was continued. Electric locomotives consume only 33 to 40 percent, and the Diesel electric locomotives only 25 to 33 percent, of the power required by conventional steam locomotives. The power consumption of the condensed steam locomotive is 15 to 20 percent below that of the conventional steam locomotive. Another advantage of these three types of locomotives is that they can travel 600 to 1,000 km without refueling, while the conventional steam type locomotive must refuel every 150 km. After the war attempts were made to use natural gas to supplement coal, mazut, and oil shale as a fuel for steam locomotives. The gas, mixed with 10 to 15 percent coal dust, is burned under the boiler. The use of natural gas is also scheduled for the operation of Diesel-electric locomotives. The ignition is achieved by injecting Diesel fuel into the compressed methane gas and air mixture. The tests were successfully completed in 1950. However, the new mixture requires changes in the design of the Diesel engine. There are long-range plans for the development of gas turbines and locomotives equipped with jet engines, but these projects have not yet reached the testing stage.

4. About 80 percent of the locomotives built in the U.S.S.R. are freight train locomotives and only 20 percent are passenger train locomotives. The steam locomotive models produced are the FD-type and SOk-type for freight train traffic and the IS-type and Su-type for passenger trains. These models were developed and produced in the Thirties. The first postwar development was the L-type, steam freight locomotive, which has been manufactured since 1945. In 1949, additional postwar developments which were being tested included freight locomotive models with a 2-10-4 wheel arrangement, and a

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passenger locomotive model with a 4-8-4 wheel arrangement. The 2-10-4 locomotive type may have been put into mass production. Freight locomotives produced in the U.S.S.R. at present usually do not have more than five sets of driving wheels. However, the construction of an articulated locomotive with six sets of driving wheels was recently started. The axles of the three front driving wheels are fitted to a revolving truck which is turned often to avoid excessive wear of the tracks. The wheel arrangement of this model is 2-6-6-4. Passenger train locomotives are produced with 3 to 4 sets of driving wheels. The models with four sets of driving wheels are obviously preferred. Efforts to increase the efficiency of the locomotives by enlarging the grate area and the boilers are restricted by the load limit of the tracks. Before the war the safe load was 20.5 tons per meter of rail on the main lines, 8 tons on some feeder lines, and 6 tons on all remaining lines. It was not until after the war that the old R-38 type rails (R stands for rels, meaning rail) were replaced on a large scale by the new R-43 type rails (also called "1a" rails), weighing 43.56 kg per meter. The production of R-38 type rails has been almost entirely suspended. The R-50 type rail, weighing 50 kg per meter, is used for lines carrying heavier loads, and the R-65 type rail, weighing 65 kg per meter, is used for lines carrying the heaviest loads. So far, the new R-50 and R-65 rails have been used only on a small scale. As a rule, the load limit of the rails is determined by the ratio between the weight, in kg, per meter of rail and the axle load of the locomotive, in tons. This ratio is from 2.2 to 2.4 for the new rails. The axle load of the locomotive ranges from 18.15 tons to 29.5 tons per meter of rail. 50X1-HUM

the R-43 type rails are also suitable for the heavy FD and JS-type locomotives. This probably means that the R-50 type tracks will not be used at present, or will be used only to a small extent. Since 1949, the TE-2 type Diesel-electric locomotive has been built. It will replace the TE-1 type Diesel-electric locomotive. The TE-2 model consists of two similar units, which can also be used separately. Each unit of the TE-2 is as powerful as one TE-1 type locomotive, i.e., 1,000 hp. It is assumed that, in the official statistics, each TE-2 locomotive is counted as two units. Another, even more powerful, Diesel-electric locomotive model is being developed. The electric locomotives now being produced are the VL-22 type, which will replace the VL-19 model. Another electric locomotive model, almost twice as powerful as the VL-19 model, is in the development stage. [1] 50X1-HUM

5. Before the war, very few heavy locomotives were imported. During the war the number of such locomotives imported increased considerably and import figures were still high during the first postwar years. At present, however, the number of locomotives imported has again become negligible. Countries exporting a small number of locomotives to the U.S.S.R. include the Soviet Zone of Germany, Czechoslovakia, and Hungary. The number of narrow-gauge and industrial locomotives imported from Eastern Europe is extraordinarily high. No locomotive exports from the U.S.S.R. have been reported.

6. Accurate information concerning the present repair situation is not available. There are many indications that the volume of repair work has increased, as compared with the prewar period. For instance, the freight load per locomotive increased from 9,500,000 ton-kilometers in 1932 to 20,000,000 ton-kilometers in 1950. These statistics were computed by dividing the total freight load by the total number of locomotives in stock. If the percentage of locomotives used for passenger traffic were deducted the freight load per locomotive would be even greater. Thus, the freight load is five to six times that hauled by locomotives in Western European countries. The freight load per locomotive was 9,500,000 ton-kilometers in 1932; 11,000,000 ton-kilometers in 1935; 13,000,000 ton-kilometers in 1936; 14,500,000 ton-kilometers in 1937; 15,000,000 ton-kilometers in 1940; and 20,000,000 ton-kilometers in 1950.

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The freight load per locomotive becomes even larger when the repair quota is taken into account. The number of defective locomotives, laid up for a complete overhaul, was 20 percent of the total stock in 1933, 20 percent in 1934 (although only 17 percent were scheduled to be repaired), and 17 percent in 1935, according to the schedule. Also, the distance covered by each locomotive has continuously increased. The average distance travelled daily by Soviet freight locomotives was 163.5 km in 1933, 185 km in 1935, 259 km scheduled in 1935, and 227.2 km in 1937. In 1947, the average distance was 375 km daily per freight locomotive. In 1949, an attempt was made to increase the daily run of each freight locomotive to 500 km by holding a contest between engine-drivers. Of 7,700 engineers who competed, 4,600 achieved distances ranging between 400 and 500 km. The utilization rate of Soviet locomotives, based on the freight load and on the distance travelled, has therefore been at least doubled, although the power of the new locomotives has increased only 50 percent. Thus, the repair quota has presumably increased as compared to the prewar level. Intermediate repair work from 1934 to 1936 was as follows:

1934	8,870 locomotives,	compared with 9,709 scheduled
1935	9,350 "	, according to schedule
1936	10,140 "	, according to schedule

Thus, from 45 to 48 percent of the total stock of locomotives was laid up for intermediate repairs. On the average, intermediate repairs were made on each locomotive every two years. In addition to this repair quota, minor repairs are made at much shorter intervals. In 1949, these minor repairs required approximately 10 days per locomotive, on a three-shift schedule. It is assumed that the present number of defective locomotives laid up for a complete overhaul is 15 to 20 percent of the total stock, and that the intermediate repair quota ranges from 14,000 to 15,000 locomotives, without counting the minor repairs.

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7. The total Soviet locomotive stock is estimated at about 30,000 units for 1950, and 32,000 units for 1951. These estimates are based on the Soviet figure for 1941 stock, which was 28,000 units. [redacted] the 1941 stock amounted to 27,000 units. [redacted] 15,000 locomotives were damaged or destroyed during the war. Assuming that 50 percent have been restored, the net loss would amount to approximately 8,000 units. A total of 4,100 locomotives must be deducted as the depreciation quota for the ten-year period from 1941 to 1951. The number of locomotives acquired by the Soviets includes 2,500 locomotives acquired through lendlease from 1941 to 1946, 1,000 locomotives through reparations and imports from 1945 to 1951, **3,000 captured locomotives** in serviceable condition, and 8,770 locomotives produced from 1945 to 1951. If the captured and imported locomotives are added to the stock of old locomotives, the 50X1-HUM number of locomotives increased 14 percent, compared with the prewar figure, and the tractive power increased about 20 percent. [redacted] 50X1-HUM the new locomotives are 50 percent more powerful than the old. While the number of locomotives increased only 14 percent and the tractive power increased only 20 percent by 1951, the freight load had already increased 45 percent by 1950. It will be some time before the new production **adequately replenishes the stock** of locomotives to meet the increased requirements. The present excessive rate of wear and the comparatively rapid deterioration of foreign-made locomotives, many of which are still being used in the U.S.S.R., have made it more difficult to build up the necessary stock of locomotives. Spare parts for these foreign-made locomotives are probably difficult to obtain. The rapid postwar increase in the percentage of the Diesel-electric and electric locomotives has substantially alleviated the locomotive shortage. Diesel-electric locomotives and electric locomotives are used in mountainous and desert regions and have considerably reduced the number of conventional locomotives required in these areas.

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8. By the end of 1949, seven plants for the construction of heavy locomotives [redacted] These plants are located at Bezhitsa, Kharkov, Gorkiy, Kolomna, Krasnoyarsk, Novocherkassk, and Voroshilovgrad. [redacted] another locomotive plant is known to exist at Ulan-Ude (N51-50,E107-37). No information is available concerning the plants at Orsk (N51-10,E58-34) and Stalinsk (N53-44,E87-10), which were scheduled to be built before the war. The plant in Orsk is presumably identical with the South Ural Machine Plant, which has not started to produce locomotives. The originally scheduled capacity of the plant was 540 steam locomotives and 540 Diesel locomotives per year. [redacted] the plant manufactured only railroad wheels in 1948, in addition to machines and machine parts. An assembly shop for an unidentified purpose was still under construction. The Stalinsk plant was scheduled to have a capacity of 540 steam locomotives per year.

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9. Most locomotive plants are located in European USSR, in areas where there are numerous railway networks and a concentration of machine-building and heavy industry plants. The locomotive plants are particularly concentrated in the Eastern Ukraine and in the area of Rostov (N47-15,E39-53). Only two locomotive plants are in Siberia and there are no locomotive plants in the Urals and in Central Asia.

10. The Krasnyy Profintern Locomotive and Railroad Car Plant at Bezhitsa is an old plant. After the last prewar plant expansion, from 1931 to 1936, the production capacity was 12,000 railroad cars per year, most of which were four-axle hopper cars, tank cars, refrigerator cars, and flatcars; 200 steam locomotives, and 400 forge hammers. When the plant was reconstructed after the war, large, new installations were set up. [redacted] the plant was scheduled to double its prewar capacity by the end of 1950. The prewar expansion projects apparently have not been realized, [redacted] production during 1949 and 1950 of only 200 locomotives with tenders and about 4,000 railroad cars, including four-axle boxcars, gondola cars, and refrigerator cars. [redacted] the 1951 production of locomotives with tenders was to be increased to 300 units, upon completion of several new assembly shops.

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11. Plant No. 183, for the construction of transport vehicles, is located at Kharkov. It is an old plant which produced the SOk-type steam locomotive until World War II. Also, this plant possibly produced the 1,050 hp, Diesel-electric locomotive with a 4-10-2 wheel arrangement, a small number of which have been produced since 1931. [redacted] the plant has an estimated capacity of 200 steam locomotives per year. In 1947, the plant started the construction of the TE-1 type Diesel-electric locomotive, in conjunction with Plant No. 75 for Diesel engines in Kharkov and the KhEMZ plant for electric motors. The TE-2 type Diesel-electric locomotive has been built since 1950. The production of this plant reportedly included Diesel locomotives for industrial plants, and electric cranes. The plant capacity for the production of Diesel locomotives is estimated to be more than 300 units per year. In this estimate, the TE-2 model, which consists of two coupled units of equal power, is counted as two locomotives. 2

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12. The Krasnoye Sormovo imeni Zhdanova Machine Plant No. 112 at Gorkiy is an old installation. After the last prewar plant expansion, from 1933 to 1937, the plant capacity was scheduled to be 130 steam locomotives per year, plus Diesel engines totaling 50,000 hp. Before the war the plant produced locomotives, railroad cars, ships, and tanks. During the war the plant was almost exclusively assigned to fill armament orders. The construction of the Sur-type locomotive was resumed in August 1947. At present, the plant produces locomotives, Diesel freight and passenger ships, floating dredges, and icebreakers. There is also a small-scale production of tanks, and railroad cars are occasionally produced. It is possible that 100 to 130 locomotives are produced per year.

13. The V.V. Kuybyshev Machine Plant at Kolomna is one of the oldest, and also the second largest, of the Soviet locomotive plants. After the last prewar expansion, from 1933 to 1937, the plant capacity was scheduled to be 275 steam locomotives, 100 Diesel locomotives, and 20 electric locomotives per year, plus Diesel engines with a total capacity of 450,000 hp. In 1940, the plant actually produced only 320 locomotives, although it had an annual capacity of 600 locomotives, because it had been converted to armament production. The locomotive production was resumed in 1945 when the new L-type locomotive was built. The L-type locomotive was put into mass-production in 1947. In 1949, the development of the new P-34 type locomotive, equipped with six driving axles, was ready for test runs. It was hoped that this model could be put into mass-production in 1950. Considering the high prewar capacity of the plant and the intensive postwar modernization, the present annual production of the plant is estimated at 550 to 600 locomotives.

14. The Plant for the Construction of Heavy Machinery and Locomotives at Krasnoyarsk did not start operating before World War II. The production of this plant includes SOk-type locomotives and heavy cranes with capacities of from 20 to 150 tons, and some cranes with a capacity of 250 tons. In 1949, the plant produced only 100 locomotives, although the quota was 120 units. By 1951, the production will probably increase to 120 or 150 units.

15. The Budennyy Locomotive Plant at Novocherkassk is a new installation which was built between 1932 and 1937. According to the construction plan, the plant was scheduled to have a capacity of 720 narrow-gauge and industrial locomotives per year. After the war the plant was completely rebuilt with equipment dismantled from the Soviet Zone of Germany. The production of electric locomotives started in 1947. Main-line and industrial locomotives are produced. The production of main-line locomotives was 220 units in 1950 and was to be increased to more than 300 units by 1951.3

16. The Locomotive and Railroad Car Plant at Ulan-Ude is located in the northwestern part of the town. The construction of the plant started in 1932. Production was to begin in 1936 and the entire project was to be completed in 1937. The annual capacity of the plant was scheduled to be as follows:

General repair of steam locomotives	450 units
General repair of freight cars	7,200 "
Construction of new, main-line, steam locomotives	100 "
Grey, iron-cast parts	12,000 tons
Steel-cast parts	14,000 "
Forgings	10,000 "

[redacted] 16 SO-type steam locomotives and 35 railroad cars were constructed in 1938. In addition, 50 to 60 locomotives and 750 railroad cars per month were given a general overhauling. The construction of locomotives was scheduled to be increased to 80 SO-models and 90 L-models in 1939. The annual production of railroad cars was scheduled to reach 600 units. During the war the plant was expanded and parts of plants evacuated from the western areas of the U.S.S.R., allegedly including Locomotive Plant No 183 in Kharkov, were added to this plant. This allegedly 50X1-HUM

increased the steel output to 40,000 tons per year, of which 20,000 tons were consumed by the plant itself. A large part of the plant was converted to armament production, including ammunition, weapons, and, allegedly, tanks. After the war, full-scale production of locomotives and railroad cars was resumed. [redacted] the plant included an iron foundry; a steel foundry, equipped with three open-hearth furnaces, each with 21 square meters of hearth surface, and two electric furnaces, each with a capacity of 6 tons; a bar-rolling mill; a forge and punching shop; a locomotive assembly shop, a railroad car repairshop with a new building; a power station; and a locomotive repairshop. In 1951, the equipment of the locomotive repairshop included an assembly line for the repair of frames, with 10 stationary and four portable lathes. The production of the frame repair installation was increased 600 percent by the installation of this assembly line. It is assumed that about 150 SOk-type locomotives were produced in 1950 and 1951. A new locomotive model with a 2-10-4 wheel arrangement was being tested in 1949. It is not known whether this model has since been put into mass production. Successful tests were reported to have been made in 1952 in remodeling the firing equipment of wood-fired locomotives. With the new wood-firing equipment the time required to fire-up the boiler can be reduced from about 13 hours to 2 hours, and 2 tons of fuel are saved. The construction of new railroad cars also appears to have been increased since the war. The production in March 1950 is reported to have exceeded the quota by eight cars. The number of workers in 1941 was reported to be 15,000. Recent information as to number of employees is not available. 50X1-HUM

17. The October Revolution Locomotive Plant in Voroshilovgrad is an old installation built from 1890 to 1900. After the last prewar plant expansion, between 1928 and 1937, the production capacity was 1,080 E and FD-type freight locomotives and JS-type passenger locomotives. The plant had a capacity of 400 locomotives in 1935, and of 600 locomotives in 1936. Part of the plant had been converted to tank production before the war. The machines were evacuated during the war and the installations were partly destroyed. Reconstruction of the plant started immediately after its recapture by the Soviets and armament production was resumed. The construction of locomotives was resumed in late 1945. The armament production, including casting of tank cupolas and bogie wheels, was suspended in mid-1946. The locomotive production was 30 to 31 units monthly in mid-1948, 35 units in September 1948, 36 units in October 1948, 39 units in December 1948, 36 units in January 1949, 40 units monthly from February 1949 to July 1949, and 58 units in September 1949. [redacted] the 1950 schedule called for a monthly production of 60 locomotives. SO, FD, and JS type locomotives were built in the plant. The first test locomotive with a 2-10-4 wheel arrangement was completed in late 1948. It was being tested in 1949 and may since have been put into mass production. Tests with Diesel locomotives were reported to have been made in 1950. [redacted] part of the plant was scheduled to be converted to the construction of Diesel locomotives. 50X1-HUM

[redacted] Comments. 50X1-HUM

1. For details on locomotive types, see Pages 9, 10, and 11. Page 12 gives data on locomotive tenders. The enclosure is a set of photographs of various locomotives. [redacted] 50X1-HUM

2. The information on the TE-1 and TE-2 models contained in this report supersedes that previously reported [redacted] 50X1-HUM

3. Information on the Krasnyy Profintern Locomotive and Railroad Car Plant, the Krasnoye Sormovo imeni Zhdanova Machine Plant No. 112, the Plant for the Construction of Heavy Machinery and Locomotives at Krasnoyarsk, and the Bud'onnyy Locomotive Plant was previously given

4. [redacted]

[redacted] 50X1-HUM

Technical Data on the Most Important Soviet Steam Locomotives

	Steam Freight Locomotives								Steam Passenger Locomotives		
	Eu	Em	FD	SO	SOk	L	1949 model	P-34	Su/Sur	JS	2
Wheel arrangement:	0-10-0	0-10-0	2-10-2	2-10-0	2-10-0	2-10-0	2-10-4	2-6-6-4	2-6-2	2-8-4-	4-8-4
In production since:	1926	1934	1931	1935	1936	1945	1950?	1950?	1925	1932	-
Modernized since:	production ended	production ended									
Cylinder diameter(mm)	650	650	670	650	650	...	...	4 cylinders	575	670	...
Piston stroke (mm)	700	700	770	700	700	...	...	...	700	770	...
Evaporation surface(square meters)	207	198	295.2/ 247.3	230	227	222	...	...	197	295	...
Superheater surface (square meters)	...	60	138.5/ 122.5	93.6	...	131	...	...	72.7	148.4	...
Grate surface (square meters)	4.46	4.46	7.04	6	6	6	8.5-8.7	9.5-10	4.73	7.04	...
Steam pressure(atmosphere)	12	14	15	14	14	14	...	...	13	15	...
Service weight (tons)	125	130	235	145	170	135.5	165	190	130	235	...
Adhesion weight (tons)	81.2	83	103	87.5	94	91	...	135-138	54	82	90

(Last cont'd from page 9)

Axle pressure (tons)	17.2	18.6	20-22.8	19.3	19	19.2	23	22.5	8.9	12	...
Technical speed(km/h)	65	65	85	75	75	80	...	...	130	130-140	...
Maximum weight of train(tons)											
at 0.5 percent grade	2350	2540	2980	2520	2510	...	...	3500	...	...	...
at 0.6 percent grade	2040	2190	2580	2190	2180	...	...	...	...	...	...
at 0.8 percent grade	1600	1715	2020	1715	1710	...	...	...	650	800	...
Maximum power (hp)	1400	1700	3100	2000	1710	2200	2500	3000	1900	3000	...

The abbreviations have the following meaning:

Eu, Em, E are type designations; u (usilennaya) means reinforced, m (modernizirovannaya) means modernized.
FD (Feliks Dzerzhinskiy) is a type designation.
SOk (Sergo Ordzhonikidze) is a type designation; k means condensed steam locomotive.
L (Lebedyanskiy) is the name of the chief designer of this locomotive.
Sur = S is a type designation, u means reinforced, r (rekonstruirovannaya) means reconstructed.
JS (Josef Stalin) is a type designation.
The locomotives with the 2-10-0 wheel arrangement, especially the SO type, were occasionally referred to as Decapods.

Technical Data on Soviet Electric Locomotives and Diesel-electric locomotives.

	VL 22	SS	PB	Test models
Wheel arrangement	0-6-0 0-6-0	0-6-0 0-6-0	4-6-4	16
Service weight (tons)	126	132	...	180
Axle pressure (tons)	22	...	...	...
Length (mm)	16,220	16,480	16,560	...
Number of motors	6	6	8	8
Power (hp)	2,770	2,770	2,770	5,350
Working voltage (v)	1,500	1,500	1,500	...
Maximum speed (km/h)	75	...	...	160

The abbreviations have the following meaning:

VL - Vladimir Lenin
SS - **Supreme Soviet**) old models
PB - Politbyuro)
TE - Tepla-Elektrovoz (Diesel-electric locomotives)

	TE-1	TE-2
Wheel arrangement	0-6-6-0	0-4-4-0 0-4-4-0
Service weight (tons)	120	...
Axle pressure (tons)	...	20.6
Length (mm)	17,140	23,215
Wheel diameter (mm)	...	1,050
Number of Diesel engines	1	2
Number of generators	1	2
Number of electric motors	6	8
Power (hp)	1,000	2,000
Permissable weight of train (tons)	...	2,200
Maximum speed (km/h)	90	100
Fuel supply for (km)	1,500	2,000

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Technical Data on Soviet Locomotive Tenders.

	Tender of the FD-type locomotive	Tender of the L-type locomotive	Tender of the Su-type locomotive	Tender of the JS-type locomotive
Water supply	44 tons	28.0 tons	27.2 tons	51.0 tons
Coal supply	20 "	18.0 "	15.0 "	18.05 "
Empty weight of tender	56 "	30.7 "	32.5 "	53.8 "
Loaded weight of tender	120 "	76.7 "	74.7 "	122.85 "
Axle pressure	20 "	20.5 "	18.6 "	20.5 "
Number of axles	6	4	4	6
Wheel diameter	1,050 mm	1,050 mm	1,050 mm	900 mm
Length of tender	13,090 mm	9,946 mm	9,933 mm	12,544 mm
Ratio of the weight of the loaded tender to the locomotive weight	89:100	76:100	89:100	92:100

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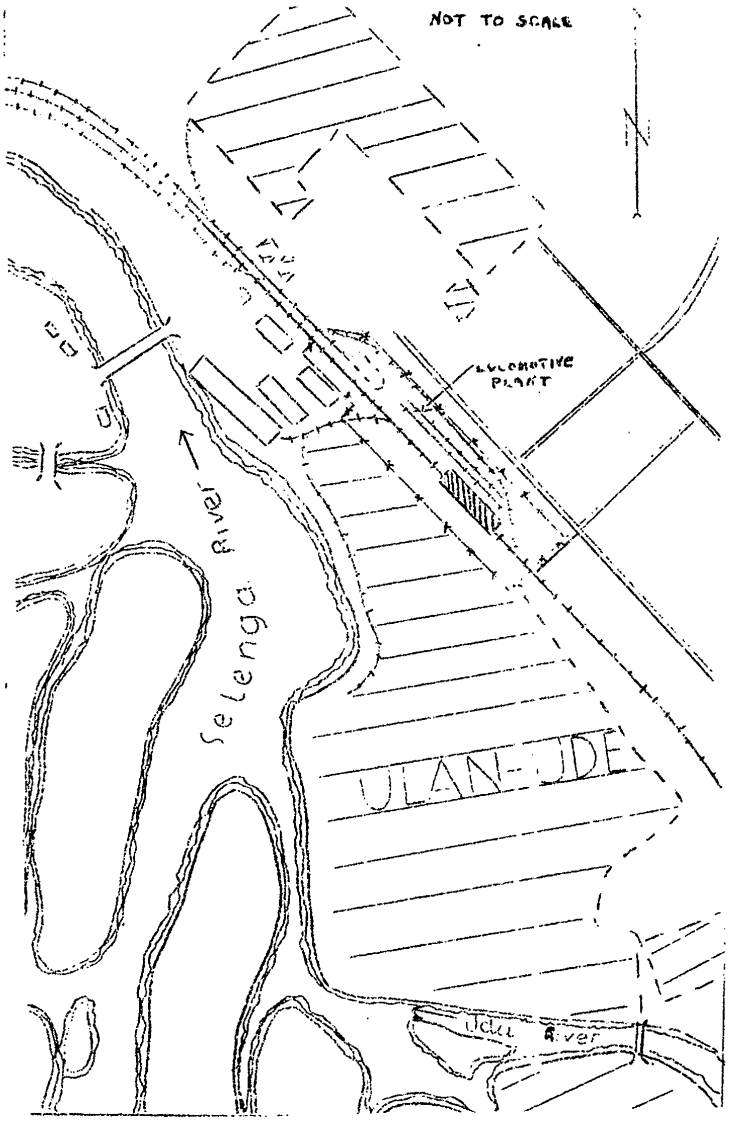
Location Sketch of the Locomotive Plant at Ulan-Ude



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"SO" TYPE PASSENGER STEAM LOCOMOTIVE.
BUILT AT GORKI LOCOMOTIVE PLANT
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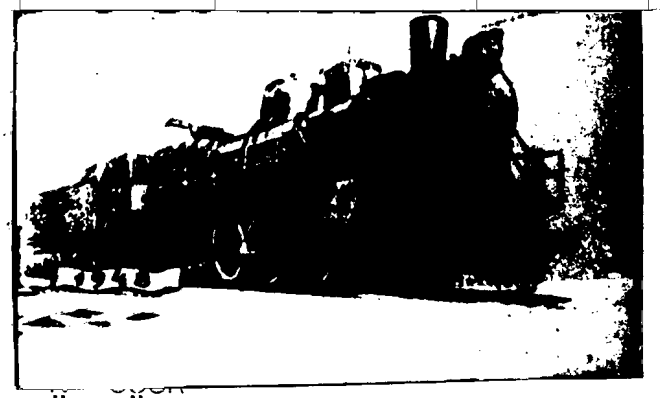

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SO-TYPE PASSENGER STEAM LOCOMOTIVE BUILT IN THE GORKI LOCOMOTIVE PLANT IN 1951 AS A MODIFICATION OF THE SU-TYPE

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"SOK" TYPE FREIGHT STEAM LOCOMOTIVE WITH TENDER. BUILT AT KHARKOV LOCOMOTIVE PLANT.
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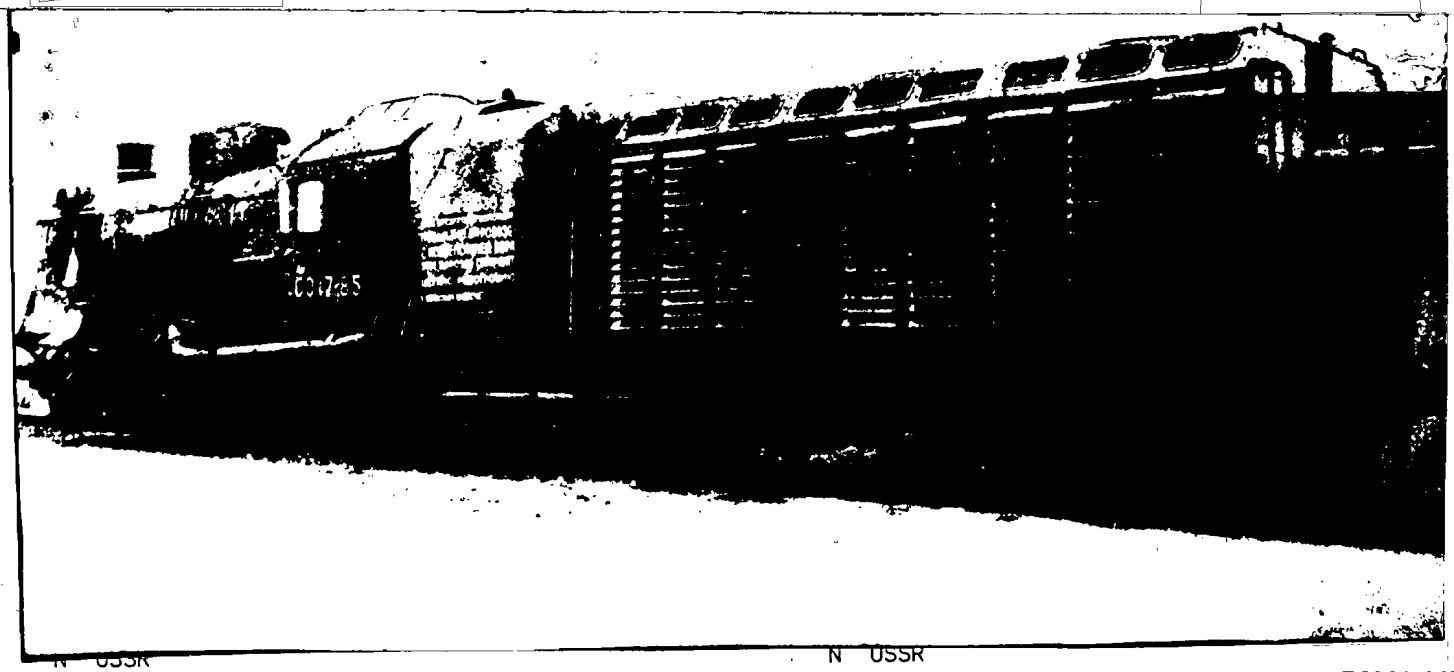
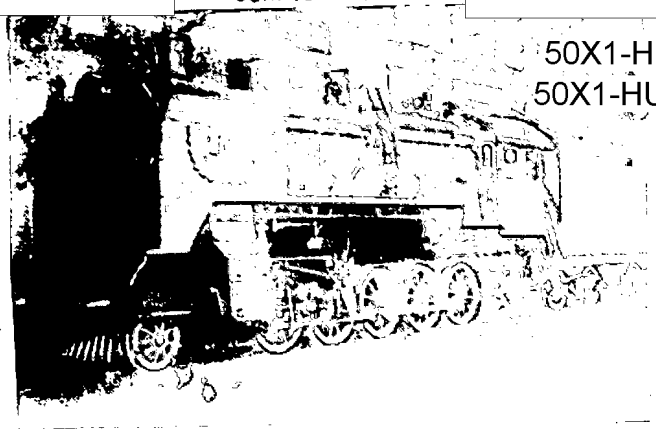


N USSR
"SO" TYPE FREIGHT STEAM LOCOMOTIVE. OLD MODEL.
CONFIDENTIAL

SO-TYPE FREIGHT STEAM LOCOMOTIVE
(OLD MODEL)

N USSR
"SO" TYPE FREIGHT STEAM LOCOMOTIVE.
NEWEST POST-WAR MODEL.
CONFIDENTIAL

50X1-HUM



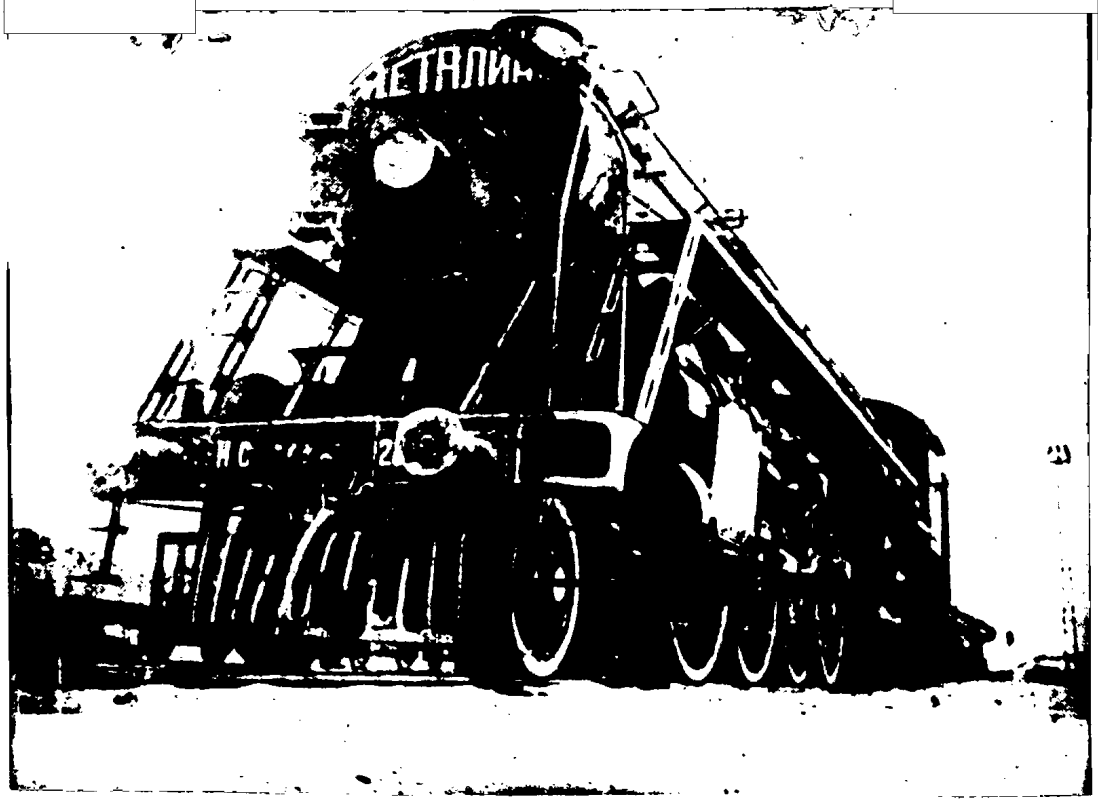
50X1-HUM
50X1-HUM

SO-TYPE FREIGHT STEAM LOCOMOTIVE
(NEWEST POST-WAR MODEL)

"JS" TYPE PASSENGER STEAM LOCOMOTIVE. BUILT UNDER 2ND FIVE-YEAR PLAN.
CONFIDENTIAL

ENCLOSURE

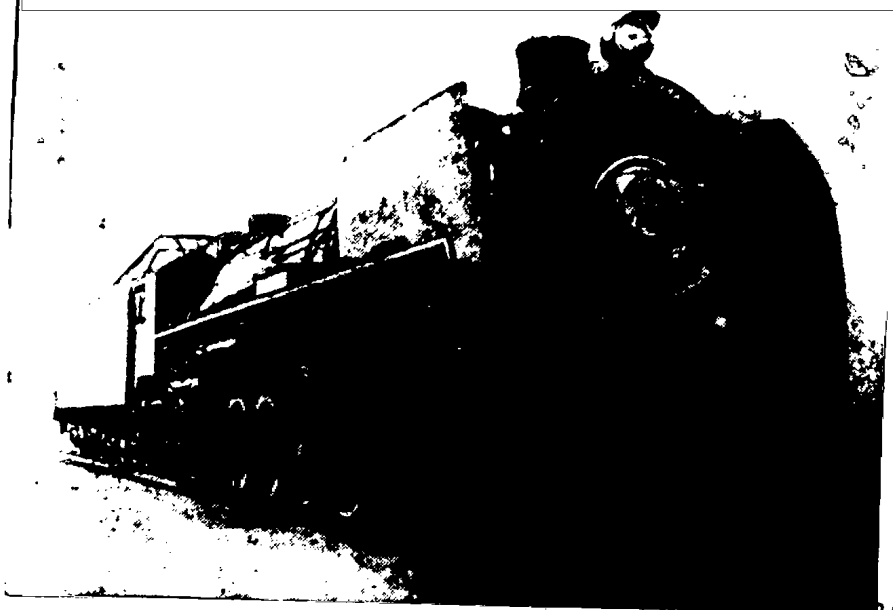
50X1-HUM



JS-TYPE PASSENGER STEAM LOCOMOTIVE. BUILT UNDER SECOND FIVE YEAR PLAN

N USSR
"FD" TYPE FREIGHT STEAM LOCOMOTIVE. BUILT UNDER 2ND FIVE-YEAR PLAN. CONFIDENTIAL

50X1-HUM



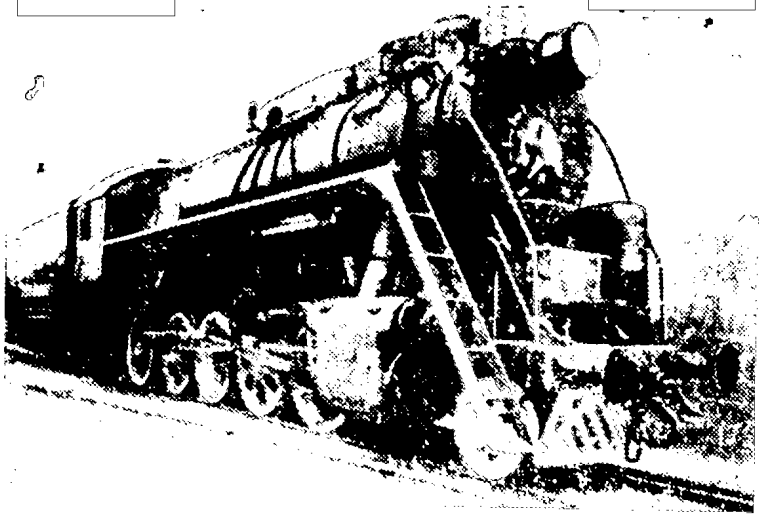
FD-TYPE FREIGHT STEAM LOCOMOTIVE. BUILT UNDER SECOND FIVE-YEAR PLAN

US SECURITY INFORMATION CONFIDENTIAL

"L" TYPE FREIGHT STEAM LOCOMOTIVE. DEVELOPED BY KOLOMNA LOCOMOTIVE PLANT [redacted] CONFIDENTIAL [redacted]

50X1-HUM

50X1-HUM



L-TYPE FREIGHT STEAM LOCOMOTIVE, DEVELOPED BY THE PLANT IN KOLOMNA IN 1945.

[redacted]

ENCLOSURE

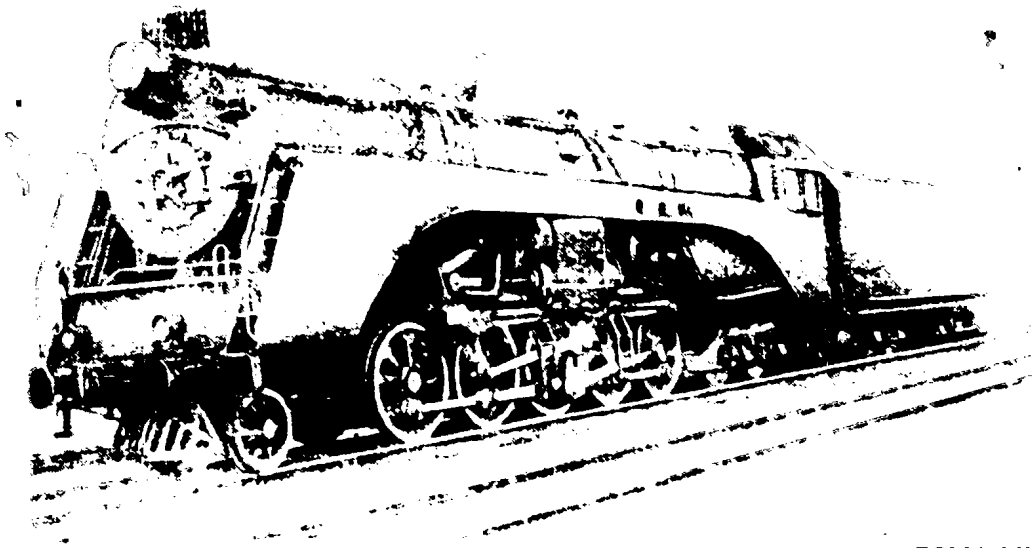
50X1-HUM

N USSR

"2-10-4" FREIGHT STEAM LOCOMOTIVE. DEVELOPED BY VOROSHILOVGRAD LOCOMOTIVE PLANT [redacted] CONFIDENTIAL [redacted]

50X1-HUM

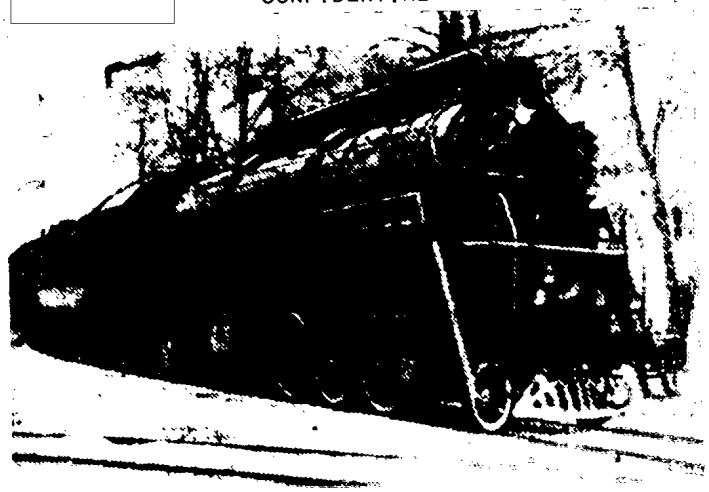
2-10-4 FREIGHT STEAM LOCOMOTIVE, DEVELOPED IN 1945 BY THE LOCOMOTIVE PLANT IN VOROSHILOVGRAD



N USSR

"P" TYPE FREIGHT STEAM LOCOMOTIVE AT KOLOMNA LOCOMOTIVE PLANT [redacted] CONFIDENTIAL

50X1-HUM



P-TYPE FREIGHT STEAM LOCOMOTIVE, DEVELOPED IN 1945 BY THE LOCOMOTIVE PLANT IN KOLOMNA (K)

50X1-HUM

[redacted]

ENCLOSURE

N USSR

ELECTRIC LOCOMOTIVES, "VL-19" TYPE ON LEFT, "VL-22" TYPE ON RIGHT.
BUILT IN NOVOCHERKASSK LOCOMOTIVE PLANT [redacted]

[redacted] CONFIDENTIAL [redacted]

50X1-HUM

50X1-HUM

MODERN ELECTRIC LOCOMOTIVES BUILT IN THE LOCOMOTIVE PLANT IN NOVOCHERKASK SINCE [redacted]

50X1-HUM

1. VL-19 TYPE.
2. VL-22 TYPE.

50X1-HUM

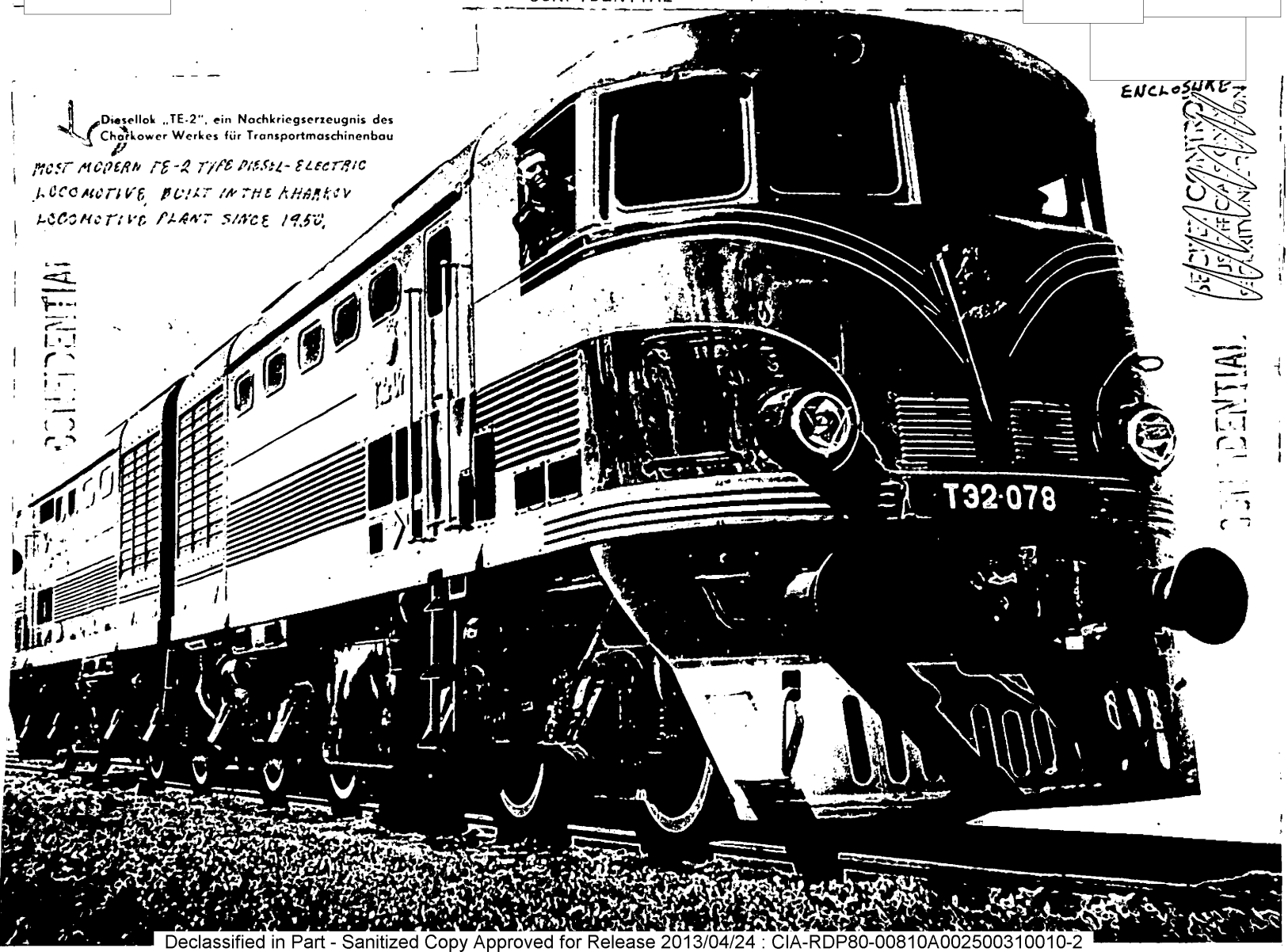
50X1-HUM

N USSR

"TE-2" TYPE DIESEL-ELECTRIC LOCOMOTIVE. BUILT IN KHARKOV LOCOMOTIVE PLANT, SINCE

CONFIDENTIAL

ENCLOSURE



Diesellok „TE-2", ein Nachkriegserzeugnis des Charkower Werkes für Transportmaschinenbau

MOST MODERN TE-2 TYPE DIESEL-ELECTRIC LOCOMOTIVE, BUILT IN THE KHARKOV LOCOMOTIVE PLANT SINCE 1950.

CONFIDENTIAL

CONFIDENTIAL

CONFIDENTIAL

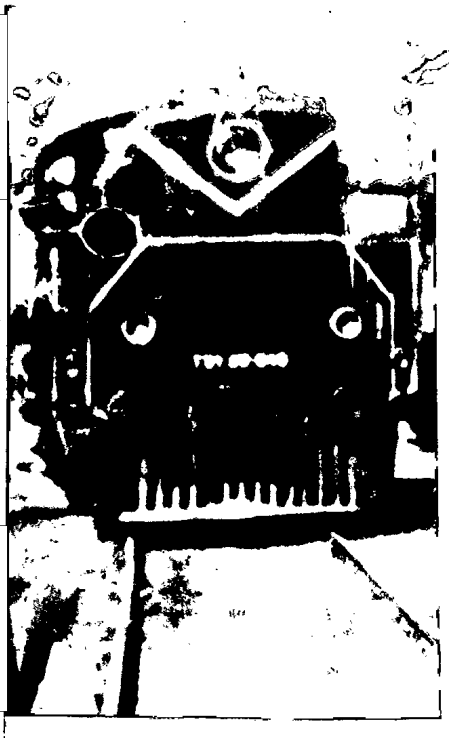
50X1-HUM

US CLASSIFIED SECURITY INFORMATION

ENCLOSURE

50X1-HUM

N USSR
"TE-1" TYPE DIESEL-ELECTRIC LOCOMOTIVE.
BUILT AT KHARKOV LOCOMOTIVE PLANT UNTIL
CONFIDENTIAL



MODERN TE-1 TYPE DIESEL-ELECTRIC LOCOMOTIVE BUILT IN THE KHARKOV LOCOMOTIVE PLANT UNTIL

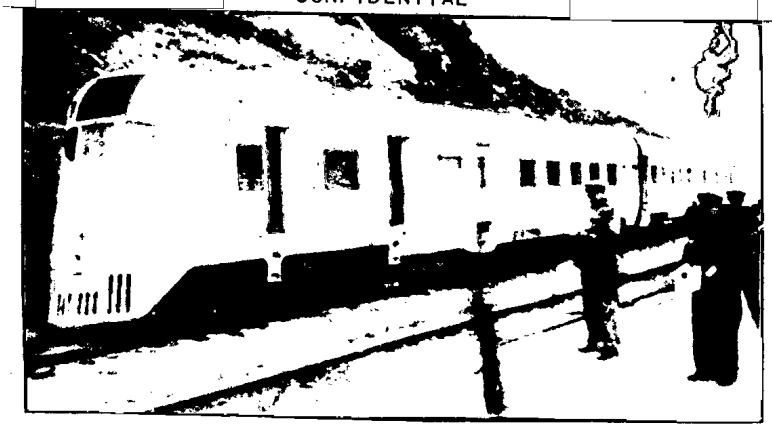
50X1-HUM

50X1-HUM

50X1-HUM

N USSR
DIESEL PASSENGER TRAIN.
CONFIDENTIAL

50X1-HUM



MODERN DIESEL TRAIN

SECRET CONTROL

CONFIDENTIAL